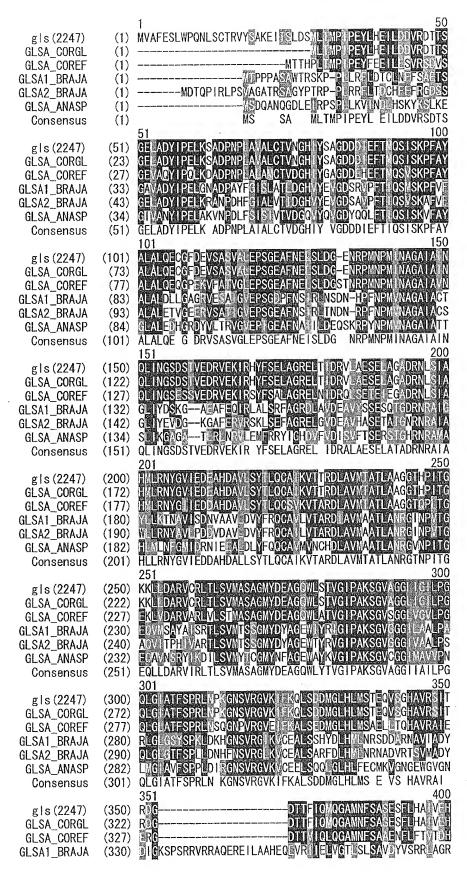
EXHIBIT A

Alignment of amino acid sequences of glutaminases



| 01 010 881 11 | (0.40) | NAC LOOP POR PRODUCTION IN THE PRODUCTION OF THE | _ |
|----------------------------|----------------|--|---|
| GLSA2_BRAJA GLSA_ANASP | (340) (332) | VYGISSRRSROPHEQOILDERHSDIR VELVGA NEGTIDYVTRR TSE | |
| Consensus | (351) | | |
| | | 401 | |
| g s(2247) | (379) | NFEGIEVVLDLIRVLSFIPVAIRM (KEGLKR I RDAGFEVF I LDPDDVLPD | * |
| GLSA_CORGL GLSA_COREF | (356) | DETGEKVVI DI SRVPMERPMGRRI VKEGI RRI RDNGEKVALYDDED I PO | |
| GLSA1_BRAJA | (380) | P-RPOFY FDLHRVTSTTRAGARL VAL FEE AALNVTYV SGVRRASK | |
| GLSA2_BRAJA | (390) | NTEGTEVVLDL RVLSTHRVAIRM KEGLKRIRDAGTEVFILDRDDVLPD NTEGTEVVLDL RVLSTHRVAIRM KEGLKRIRDAGTEVFILDRDDVLPD DTIGEKVVLD SRVPMFRP GRR VKEGLRRIRDAGTEVAI YDP ED LPD P-RPGFV FDLHRVTSTTRAGAR VAE AFEE AALNVTVV SGVRRASK PPN PL DDFRRVPD I TAAGAEL GET TAA GNONVTT I SGLE ASAV | Ĭ |
| GLSA_ANASP Consensus | (335) (401) | F G VVLDLTRV SF PVG RLIKEGLKRIRDAGF V I DPDDVLPD | • |
| 00113611303 | (401) | 451 500 | |
| gls(2247) | (429) | EMESDET I CKERV | |
| GLSA_CORGL GLSA_COREF | (401) (406) | EMESDGT I CKERV | • |
| GLSA_CORER GLSA1_BRAJA | (400) | WNTLREWTAEL NVRDFYLLDTAIEWAEDQIVYRYGGSIDFHETTELAEQ | |
| GLSA2_BRAJA | (440) | AAIA RTGDP RLRRFALLDDAIEWAEDQVIYRFGGFTDVKESVHLGEQ | |
| GLSA_ANASP | (335) | | |
| Consensus | (451) | F FSDGT R 501 550 | |
| gls(2247) | (442) | 501 | |
| GLSA_CORGL | (414) | | |
| GLSA_COREF | (424) | DILLEGI CADELACI CALOTIDIVOCCAVII TEODDADAI EEI DOCAMBUT | |
| GLSA1_BRAJA GLSA2_BRAJA | | PLLEGLSADELAELGAICTIRTYQSGAKILTTGDPADALFFLRSGAVHVT ALLAELDTDEIAAIVKLSTTRHYTAGQRVIAAGAPANSLFFLQSGMVSVK | |
| GLSA_ANASP | (335) | | |
| Consensus | (501) | | |
| gls (2247) | (442) | 551 600 | |
| GLSA_CORGL | (414) | | • |
| GLSA_COREF | (424) | | |
| GLSA1_BRAJA | | LPDGVRLATLTAGMAFGEMALLEQTRSADVFADMAATAFEAPLKDFERFR | |
| GLSA2_BRAJA GLSA_ANASP | (335) | LRSGVRLASLGPGMEFGEMAILERTRSADVFADTPVACLELPLDSFADYR | |
| Consensus | (551) | | |
| | | 601 635 | |
| gls (2247) | (442) | | |
| GLSA_CORGL GLSA_COREF | (414) (424) | | |
| GLSA1_BRAJA | | EQHPRASERIMRNLAQLLADRLIVANAKVDILTST | |
| GLSA2_BRAJA | | RLHPETALKIMRNLAAILARRLVAANAKVDLLSAY | |
| GLSA_ANASP | (335) | | |
| Consensus | (601) | | |
| | | Corynebacterium glutamicum | |
| | | Corynebacterium efficiens. | |
| | | : Bradyrhizobium japonicum, ; Bradyrhizobium japonicum | |
| | | Anabaena sp. (strain PCC 7120) | |
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